/ Computer Center bulletin. /

COMPUTER CENTRE

QUARTERLY BULLETIN

Quarters ending December 1973, March 1974,
June 1974 and September 1974

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INDIA

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Dec-Sep
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OPERATION AND SCHEDULING

IBM 7044/1401

The power-cut imposed on U.P. and uncertain power supply have severly dislocated our operations. The facility is shut-down daily from 7am - 11am because of the power-cut. Sundays and Second-Saturdays are Institute holidays. Extreme voltage fluctuation in the power supply has caused lengthy shut-downs. In September we lost over 320 running-hours because of power failures and voltage fluctuation. When running normally, our daily load is 200 Fortran jobs, 200 Watfor jobs and 6 hours of Long jobs. In addition, the programming labs TA306 and CS610 are run on the system.

IBM 1800

The IBM 1800 System operates on Open Shop basis for individual research projects. The main applications of the System are in the areas of Scatter Communication, Data Acquisition of Nuclear Experiments on the Van de Graff Accelerator and Control of Pilot Plant in Chemical Engineering.

PDP 1

The Programmed Data Processor (PDP-1) was gifted by [illegible] Stanford University about two years ago. It is a high speed, solid state (discrete devices) general purpose computer. Special feature of the computer is that it can operate with many types of input-output devices without any internal machine change. Our system has PDP-1 Central Processing Unit, a sixteen channel sequence break system, a 10 bit analog to digital converter, a 10 bit digital to analog convertor, a 32K words (18 bit) memory (cycle time 55 microseconds), two high speed data channels, a 128K parallel drum, two microtape drives, one position CRT display, and a twelve console 'Remote Electronic Access and Display' (READ) system.

The READ System which was damaged during transit is being repaired at present. The common controller and one of the display consoles has been repaired and is functioning satisfactorily. A system has been designed to interface six IBM 'Remote Inquiry Units' (Electric I/O Printer with keyboard) to the system.

The aim is to have an on line time sharing system with about eight display consoles and six Remote Inquiry Units. The users will be able to simultaneously enter their programs, debug them and get their answers on these consoles. Moreover, these stations can be effectively used for interactive programming, computer aided instruction and computer aided design.

The System is expected to come into operation at the end of the current academic year.

A single tone music box has been designed and attached. The software is being developed.

A project in cassette corder as a peripheral for storing data for PDP-1 is being taken up as a B.Tech project.

During the last six months following programs have been implemented:

1. Expensive typewriter - a line text editor operated from console typewriter. A text on paper tape can also be read and modified version punched out.
2. Desk calculator - a simulated desk calculator with function defining capability and handling up to 39 places of decimal.
3. Dynamic debugging program - a program used in dynamic debugging and modification of in core programs. Additional uses are in getting partial binary dump of memory, entering small binary programs through typewriter and punching out parts of core in reloadable format.
4. MACRO - a 2 pass conventional assembler producing machine code.
5. DECAL - a single pass algebraic assembler having additional features of ALGOL. Produces relocatable output. It has excellent linking features.
6. FORTRAN - a 1 pass compiler producing Decal output is now operational. Only a limited version of Fortran is permitted.
7. SPACEWAR - a game of wits and fun played with external controls on console CRT display.
8. Comprehensive set of diagnostics, floating point package and library routines.

Programs developed here -

1. Time shared text editor for the Remote Inquiry Terminal
2. LOGO - this is a display graphic language written for PHILCO display terminals. It has basic instructions for linear and angular motion. The programming is done in the form of user defined functions. Recursive definition of functions is permitted. Each function can have upto 6 dummy parameters. Some facilities are there to give animational effect to the displayed picture. As yet only a small graphics potential is available. However, it is expected to expand LOGO into a full graphics and instructional language. An attempt is being made to write music in this language.

3. An operating system for single terminal use is projected for the next few months.
YOGESH GARG, SANJAY MITTAL, K.S. BHASKAR
(Mr. Garg is a graduate of IIT/Kanpur in E.E. and is working as an Engineer in the PDP-1 lab. Both Mr. Mittal and Mr. Bhaskar are 5th year students in E.E. at IIT/Kanpur and working part-time in the PDP-1 lab.)

NEW BOOKS IN COMPUTER CENTRE LIBRARY

CC150 Complexity of computer computation. Miller, Thatcher
CC151 Graph theory and computing. Read
CC152 Sorting and searching (Vol. 3). Knuth
CC153 Modern applied algebra. Birkhoff, Bartes
CC154 Systems thinking. FE Emery
CC155 Modern applied algebra. Birkhoff, Bartee
CC156 A management guide to Pert/CPM. Wiest, Levy
CC157 Operations research. Sasieni, et al
CC158 Linear programming. G. Hadley
CC159 Design of on-line computer systems. E. Yourden
CC160 Executive decisions and operations research. Miller, Starr
CC161 Operating systems techniques. Hoare, Perrott
CC162 Operations research. H.A. Taha
CC163 Time series analysis. Box, Jenkins
CC164 Computer simulation techniques, Naylor et al
CC165 Management models and industrial application of LP. Charnes & Cooper
CC166 Elements of combinatorial computing. M.B. Wells
CC167 Computer system organization. Organick
CC168 Computer science. Cardenas, Presser, Martin
CC169 Computer data security. Katzan
CC170 Iterative solution of nonlinear equations in several variables. Ortega, Rheinbolt
CC171 Programming systems andlanguages. S. Rosen
CC172 Digital computer fundamentals. T.C. Bartee
CC173 Programming business application in Fortran IV. PT May
CC174 Fundamental algorithms. D.E. Knuth
CC175 Introduction to programming and computer science. Ralston
CC176 Numerical methods for nonlinear algebraic equations. Rabinowitz
CC177 Computer aided network design. DA Calahan
CC178 Switching and finite automata theory. Kohavi
CC179 -same-
CC180 Graph theory with application to engineering and computer science. N. Deo
CC181 PDP 10 Timesharing handbook. Digital
CC182 System theory. Zadeh, Polak
CC183 Operating systems principles. PB Hansen

PROGRAM DEVELOPMENT

The PDP-1 computer has been powered up and tested. The drum and display units are operational. R. S. PATIL, B. K. GAIROLA, S. MITTAL

A project was taken up from District Inspector of Schools, Sultanpur for the tabulation of survey data regarding the working community and its education level in rural as well as urban areas. This will help in finding out the relationship among the various coded items. S. M. SETH, R. P. SURI

A routine has been developed to load a subsystem like FORTRAN, WATFOR, etc. through a program written in MAP. S. M. SETH

A routine was developed in MAP to read a tape prepared by IBM-1800 (fixed point information written in binary mode) and prepare an equivalent tape which can be used on IBM-7044 for further processing with very few modifications. This routine can be directly used to avoid preparing another tape. C. V. C. RAO

After successful recording of job statistics of Watfor jobs, the changes implemented earlier in Watfor compiler (Ref. Quarterly Bulletin June & Sept. 1973) were removed. C.V.C. RAO

Automatic Disk File Renewal: A program was developed on IBM 1401 to renew the files of users who have used them a certain number of times. This saves considerable 1401 time which had been used for file renewal. S. P. KHATRI, ASHWINI KUMAR

An accounting program has been developed to calculate the time used by various peripherals of IBM 7044 and 1401. S.P. KHATRI

A routine has been added in the overlap program to record the statistics of Watfor jobs on accounting disc along with other statistics. H. N. BHAGWAN, R. P. SURI

Development of All India Census Tables for I. A. M. R., New Delhi. The final phase of the project has been completed. It included processing of one percent All India data consisting of 5.6 lakhs records on tape. R. P. SURI, H. N. BHAGWAN